

NOTES

By John Preller, second officer American steamer *Tejon*, San Pedro to Balboa.—“March 28, 3 p. m., local time. In latitude 16° 56' N., longitude 100° 36' W., noted a mirage. The steamship *Empress of Scotland* passed about 5' to the southward, and at times she appeared as if cut in two, her center disappearing, while at other times bow and stern were lost and only the middle showing. Sea smooth at the time. Sky clear. Variable winds during the day boxing the compass.”

By W. H. Walker, master of the American steamer *Eelbeck*, Panama to Honolulu.—“On the passage of the American steamship

Eelbeck from Panama Canal to Honolulu, on the great circle track, there was a complete absence of the northeast trade winds; the vessel passing through light variable winds and calms for 16 days. On the 28th of March, however, when in longitude 143° West, the ship met with strong winds from the southward, accompanied by a rough sea and heavy rain. This lasted for 15 hours, shifting to the west and northwest, bringing up a high head sea which continued to retard the vessel's progress until reaching the vicinity of the islands, when the sea moderated. This unusual weather delayed the ship 24 hours.”

—W. E. H.

551.506 (73) DETAILS OF THE WEATHER IN THE UNITED STATES

GENERAL CONDITIONS

During the first half of the month the movement of cyclonic storms was mostly along the northern border but toward the end several rather intense storms developed in the far Southwest and moving across the central valleys passed off to sea. During the passage of one of these storms heavy snow fell over the southern Great Plains regions—Kansas to Texas. Another feature common to all of the months of 1926 was the great increase in energy of the cyclonic storms when reaching the Canadian Maritime Provinces and adjacent oceanic areas.

Temperature east of the Rocky Mountains, except over Montana and the Dakotas, was below normal several degrees as shown on Chart III; it was above normal by the same amount west of the Rockies. The usual details follow.—A. J. H.

CYCLONES AND ANTICYCLONES

By W. P. DAY

The first 12 days of the month were marked by generally high pressure over Canada and an accompanying succession of high-pressure areas from this region spreading southward over the United States. Five of the seven Alberta HIGHS were charted during this period. During the remainder of the month the HIGHS were more varied with respect to place of origin. The HIGH which appeared in the Northwest about the 25th was a combination of Alberta and North Pacific types.

Eighteen LOWS were plotted, several of which were quite important as storms. Of the latter, four were of the Texas type, i. e., secondaries developing over north-eastern Mexico and southern Texas.

FREE-AIR SUMMARY

By V. E. JAKL

The free-air temperature departures at all aerological stations were negative (see Table 1) and as a rule increased somewhat with altitude. This departure aloft extended to some portions of the country where surface temperatures were above normal, as over North Dakota, where Chart III, this REVIEW, shows that it was warmer than normal. Over Ellendale a change to a negative departure took place at no great elevation above the ground, the average departure increasing with altitude to -3° C. at 4,000 meters. The greatest departure was at Royal Center, in the general vicinity of which the surface negative departure, as shown on Chart III, was also greatest. Relative humidities showed no important departure at any station.

Free-air winds were of more northerly component and greater velocity than normal, the general directions having been about northwest over middle sections of the country and more nearly west over eastern sections

(see Table 2). Except at San Francisco, winds having a decided easterly component to high altitudes were almost absent, even over the most southerly stations. At San Francisco they were observed on 10 days scattered throughout the month. An exception is also noted at Ithaca, where a northeasterly wind was observed on the 21st to 10,000 meters.

Examples of wind velocity increasing rapidly with altitude as surface friction is surmounted are very common. However, instances of rapid increase are also occasionally observed that obviously can not be thus accounted for, as at Broken Arrow on the 2d. This observation showed a stratum of light northeasterly wind extending 800 meters above the ground, at the top of which the velocity fell to 1 meter per second. Immediately above this stratum, the wind changed abruptly to westerly and increased in velocity to 18 meters per second at 1,300 meters and to 32 meters per second in the next 3,000 meters. A somewhat similar condition is noted in the record of the afternoon two-theodolite pilot balloon observation at Groesbeck on the 26th, where a northeasterly wind extended with diminishing velocity to 2,000 meters, above which an abrupt change to southwesterly occurred, with rapid increase in velocity from 1 meter per second at 2,000 meters to 27 meters per second at 4,100 meters. In both cases a higher sea level pressure is found to the north or northeast of the station, which accounts for the northeasterly winds in the lower levels, and a general pressure and temperature situation over the country as a whole to account for the strong westerly winds in the upper levels, with evidently a sharp line of discontinuity intervening. Where an abrupt change in direction with altitude occurs, under ordinary conditions of fair weather, the velocities in the transition stratum are always very light.

An indication that surface friction over a not very rough terrain is ineffectual in causing turbulence to any perceptible height when the temperature is rising aloft is shown by the record at Drexel on the morning of the 17th, when a steady southerly surface wind of from 8 to 10 meters per second increased to 30 meters per second from the southwest 400 meters above the ground. The surface and aerological observations indicate that at the time of morning surface minimum temperature (-1.1° C.) the temperature increased steadily with altitude to 16.4° at 400 meters. As soon as insolation began the surface temperature rose rapidly to a maximum of 23.3° C. in 8 hours. If, before insolation began, turbulence had extended to any considerable height, a positive lapse rate would have been observed within that height.

The kite flights at Royal Center on the 16th and 17th show a change to higher free-air temperatures from one day to the next, the station on the first day being in front of a LOW and on the second under relatively higher pressure in the rear of a HIGH. A similar temperature change is noted in the Washington Naval Air Station airplane records of the 5th and 6th, where the change was